Space Weather Forecast

Issued on Sunday, 08 September 2024 at 12:15 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of G1 Minor Storms Day 1 (08 Sep) due to the arrival of a coronal hole fast wind. A glancing CME could give a chance of G1-G2 Minor-Moderate Storms on day 4 (11 Sep).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Low activity with a high peak Common-class flare from a sunspot region in the southwest. There are ten sunspot regions, with some complexity in the form a line of small interconnected sunspots across the southern centre disc. While individually relatively simple, they likely have a stronger flare potential than would normally be expected due to being magnetically connected. The only notable growth observed was in the region in the northwest with the development of a small trailer, which contains a weak delta spot, and further peripheral spots emerging. The two regions in the southwest also have some flare potential, however these are both becoming difficult to assess due to their increasing viewing angle.

A large filament eruption (arc of plasma) off the northwest produced a partial halo CME (Coronal Mass Ejection), which has been analysed. This could give a glancing blow at Earth on Day 4 (11 Sep). All other CMEs that have been observed are off the Earth-Sun line.

Solar Wind / Geomagnetic Activity: Slow wind conditions persisted with observed solar wind speeds easing from slightly elevated, at just over 400km/s to be at background at below 350km/s. Interplanetary Magnetic Field was Weak to Moderate with north-south component variable in direction and also mainly Weak. Geomagnetic activity was Quiet (Kp1-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) continued to slowly easing following the recent enhancements since 01 Sep. This remained well below the S1/Minor Radiation Storm level though.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate activity is likely through the period with a slight chance of isolated Strong flares.

Solar Wind / Geomagnetic Activity: CME influences from a large filament eruption off the northwest disc on 07 Sep are likely to give a glancing blow at Earth on day 4 (11 Sep).

A spell of Active geomagnetic activity with a chance of G1 Minor Storms is likely on day 1 (08 Sep) with the onset of a fast wind, before easing on day 2 (09 Sep). A further enhancement is likely on day 4 (11 Sep) due to the possible arrival of a glancing CME (which left the Sun on 07 Sep). This will likely bring Unsettled to Active (Kp3-4) conditions, with a chance of G1-G2 Minor-Moderate geomagnetic storms on day 4 (11 Sep).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy

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protons) is currently above normal background levels, but well below the S1/Minor radiation storm threshold, and is forecast to continue easing towards background. There is a slight chance of any notable solar flares resulting in further enhancements.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	30	5	5	30
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	60	60	60	60
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	15	15
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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